

Claims

We claim:

- 5 1. A system for monitoring a thermal barrier coating, comprising:
 a combustion turbine component coated with a thermal barrier coating, the
 coating comprising:
 a thermal stimulatable substance adapted to function as a visual
 high-lighter, and
10 a mechanism to adhere the thermal stimulatable substance in the
 coating;
 a detector to detect removed pieces of the thermal stimulatable substance;
 and
 an analyzer to analyze the removed pieces of the thermal stimulatable
15 substance to determine damages of the coating.
- 20 2. A system according claim 1, further comprising an output device to output a
 a damage readable form.
- 25 3. A system according claim 1, wherein the component is coated with a plurality of
 layers of thermal barrier coatings.
- 30 4. A system according claim 1, wherein a plurality of components are coated with a
 thermal barrier coating.
- 35 5. A system according claim 4, wherein a plurality of components are coated with
 thermal barrier coatings, the thermal barrier coating containing different thermal
 stimulatable substances.
- 40 6. A system according to claim 1, wherein the stimulatable substance is an alkali
 metal or an alkaline earth metal.
- 45 7. A system according claim 1, wherein the combustion turbine component is a
 turbine blade or a turbine vane.

8. A system according claim 1, wherein the combustion turbine component is a combustion engine.

5 10. A system according claim 1, wherein the combustion turbine component is a heat shield.

11. A method for monitoring a thermal barrier coating, comprising:
providing a thermal stimulatable substance adapted to function as a visual high-
10 lighter;
providing a mechanism to adhere the thermal stimulatable substance in the coating;
providing a detector to detect removed pieces of the thermal stimulatable
substance; and
providing an analyzer to analyze the removed pieces of the thermal stimulatable
15 substance to determine damages of the coating.

12. A method according claim 11, further comprising: providing an output device
to output a damage readable form.

20 13. A method according claim 11, further comprising: providing a mechanism for
remote monitoring.

14. A method according claim 11, further comprising: providing a mechanism for
real-time monitoring.

25 15. A method according to claim 11, wherein the stimulatable substance is a alkali
metal or a alkaline earth metal.

16. A component, comprising:
30 a thermal barrier coating with a thermal stimulatable substance adapted to
function as a visual high-lighter, and a mechanism to adhere the thermal stimulatable
substance in the coating;
 a detector to detect removed pieces of the thermal stimulatable substance;
 and

an analyzer to analyze the removed pieces of the thermal stimulatable substance to determine damages of the coating.

17. A component according claim 16, wherein the component is a combustion
5 turbine component.

18. A component according claim 16, wherein the component is coated with a plurality of layers of thermal barrier coatings.

10 19. A component according claim 16, wherein the thermal barrier coating containing different of thermal stimulatable substances.

20. A combustion turbine component according claim 16, wherein the stimulatable substance is an alkali metal or an alkaline earth metal.

15 21. A component according claim 16, wherein the component is a metal or ceramic component.